Available online at www.sciencedirect.com
ScienceDirect
Biochimica et Biophysica Acta 1768 (2007) 1861
Biochimica et Biophysica Acta
BBA
www.elsevier.com/locate/bbamem

Preface

Preface to the special issue on amyloidogenic protein–membrane interaction

Amyloids were discovered in human tissues by Virchow and colleagues in 1854. The major components of amyloids are fibrillar proteins. More than 20 diseases are known to accompany the deposition of amyloids (amyloidosis). The investigation of amyloidosis is a hot topic not only in the field of medical sciences but also in protein chemistry and biophysics, especially because amyloidosis includes severe neurodegenerative diseases. For example, Alzheimer's disease, the most common form of dementia, is believed to be triggered by the deposition of amyloid β-protein on neurons. Parkinson's disease, Huntington's disease, and Creutzfeldt–Jakob disease are related to the fibrillization of α-synuclein, polyglutamine, and Prion protein, respectively.

The abnormal aggregation of these proteins is proposed to occur by nucleation-dependent (or seeded) polymerization, in which the formation of a nucleus (seed) is the rate-limiting step. Several biological components, such as metal ions and other proteins, are known to accelerate the nucleation. Accumulating evidence suggests that membranes also play a pivotal role in the amyloidogenesis of the neurodegenerative disease-related proteins.

This special issue collects 12 review articles on amyloidogenic protein–membrane interaction by leading scientists in the field. The first 5 articles focus on the methodology. Fluorescence, high-resolution NMR, solid-state NMR, infrared spectroscopy, and kinetics are be summarized by Munishkina and Fink, Hoshino et al., Naito and Kawamura, Komatsu et al., and Murphy, respectively. Specific topics on amyloid β-protein and islet amyloid polypeptide are then reviewed by Matsuzaki, Yanagisawa, Arispe et al., Lal et al., Smith et al., Zinser et al., and Jayasinghe and Langen. These papers cover physicochemical, chemical, and biochemical aspects of amyloidogenic protein–membrane interaction. I am confident that this special issue will give valuable, cutting-edge information and stimulating ideas to all scientists in this research area.

Katsumi Matsuzaki
Graduate School of Pharmaceutical Sciences,
Kyoto University,
46-29 Yoshida-Shimoadachi-cho,
Sakyo-ku, Kyoto 606-8501, Japan
E-mail address: katsumim@pharm.kyoto-u.ac.jp.

0005-2736/$ - see front matter
doi:10.1016/j.bbamem.2007.04.014